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X A CONCENTRATE SPRAYER FOR EXPERIMENTAL USE

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In connection with experimental work on control of the tomato fruitworm (Heliothis armigera (Hbn.)) at Columbus, Ohio, a sprayer was needed for the application of small measured volumes of concentrated emulsions. A No. 28 DeVilbiss atomizer was modified as described herein to provide good coverage of individual tomato plants in field plots with 1 to 2 ml. of spray. To assist in obtaining coverage and to control spray drift, the plants were covered with an adjustable cage during the spraying operation.

Description of Sprayer

The glass reservoir of the atomizer was replaced by a $2\frac{1}{2}$ -inch bottom section of a test tube $\frac{3}{4}$ inch in diameter (fig. 1,A). The test tube section was attached to the metal top of the atomizer with sealing wax. The liquid supply tube (B) consisted of a piece of $\frac{1}{8}$ -inch copper tubing soldered to the metal screw top of the original glass supply tube, and cut barely to clear the bottom of the test tube reservoir. A piece of $\frac{3}{8}$ -inch brass tubing 8 inches long (C) was bent as indicated and a hole (D) made to receive the atomizer nozzle extension rod. A piece of brass tubing of a diameter to fit closely inside the air tube (C) was cut about $\frac{3}{4}$ inch long. This piece (H) was soldered in place after it had been filed on one end to form four prongs, which were bent inward to make a guide for the atomizer nozzle extension rod. The junction (D) was soldered after the atomizer nozzle was adjusted so that it was $\frac{1}{32}$ to $\frac{1}{16}$ inch in from the end, and on the axis of the air tube (C). A $\frac{3}{16}$ -inch hole (F) was bored in the air tube (C) and a piece of $\frac{1}{8}$ -inch copper tubing soldered in place between the hole and the bulb end of the atomizer (G). The brass disk (E) was soldered in place after the orifice of $\frac{7}{32}$ inch was determined by trial.

Operation of Sprayer

A 2-cylinder air compressor of the paint-sprayer type, set at 17 pounds pressure and powered by a small gasoline engine, supplied the air for spraying. An air line with a cut-off valve connected the compressor and the sprayer. Air entered the sprayer at J and divided at F. Part went through the atomizer and delivered the spray at the outlet E, and the remainder passed through the air tube C and joined the atomized spray at the outlet. Should the orifice in the disk E be too large, or air pressure

too low, insufficient air will be forced through the atomizer to produce the spray at E. Should the orifice be too small, insufficient volume of air will be delivered by the sprayer to obtain good spray coverage. The liquid reservoir A may be calibrated, or previously measured volumes of the emulsion may be placed therein.

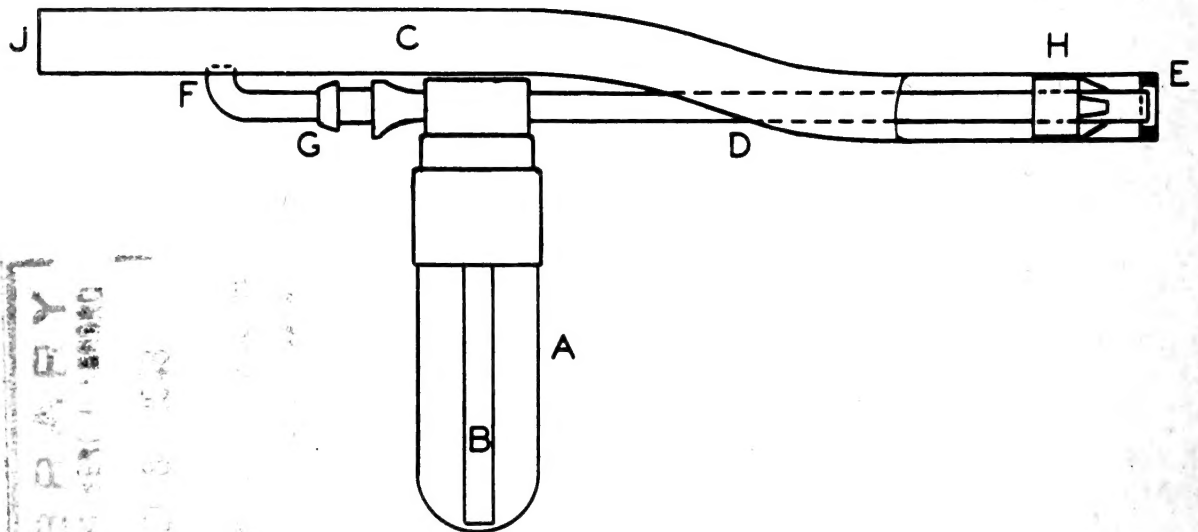


Figure 1.--Diagram of concentrate sprayer with cutaway view of nozzle end.